New *Australobolbus* H. Howden et J. Cooper, 1977 (Coleoptera: Geotrupidae: Bolboceratinae), with a key to Papuan species

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Abstract: A new species of genus *Australobolbus* H. Howden et J. Cooper, 1977 from Arfak Mountains, western New Guinea, is described. An annotated species list of *Australobolbus* is presented. An updated identification key to *Australobolbus* species from the Papuan region is provided.

Key words: Coleoptera, Geotrupidae, Bolboceratinae, *Australobolbus*, key to species, New Guinea, Australia.

Introduction

Australobolbus H. Howden et J. Cooper, 1977 is a Bolbocerine genus of 47 recent species and subspecies (including a new species described herein). *Australobolbus* is distributed all over the Australian mainland with nine species (including a new one) on New Guinea and satellite islands as well as on Tanimbar Islands (H Howden & J. Cooper 1977; H. Howden 1992; H. Howden et al. 2007). Two species, *Australobolbus cruciatus* H. Howden, 1990 and *A. loweri laratinus* (Arrow, 1916), are shared between the Australian (Queensland) and Papuan fauna. All other taxa show more restricted distribution (H. Howden et al. 2007). All the present distribution area of *Australobolbus* but Tanimbar Islands meets with the area of Sahul shelf. Tanimbar Islands have never been a part of Sahul and therefore were not connected with Australia and New Guinea in the past. The nearest distance between the Tanimbars and Sahul shelf nowadays is about 30 km - a distance relatively easy reachable for flying insects. According to a present classification of Scarabaeoid beetles (Smith 2006), the genus belongs to the tribe Australobolbini Nikolajev, 1996 of the Bolboceratinae Geotrupidae.

The main characters distinguishing *Australobolbus* from related Australian and Papuan genera are (H. Howden 1992; H. Howden et al. 2007) the wide scutellum, presence of seven elytral striae between the suture and humeral umbone and total body length below 13 mm. External sexual differences are not apparent in this genus. The New Guinea *Australobolbus* are usually dark brown or black or with the pronotum light brown and the head and elytra dark brown with few exceptions (*A. parvus* H. Howden, 1990 and *A. rotundatus* (Hope, 1841) have reddish brown to pale reddish body). In contrary, Australian representatives are mostly reddish or pale brown.

Australobolbus species are reported from arid grasslands to moist rainforest areas. In Australia, their habitat types range from wet coastal rainforests to moderately dry, open *Eucalyptus* forest and desert areas. These beetles were reported from sandy-loam or clay soils. On New Guinea, *Australobolbus* inhabit lowland and lower montane rainforests and were reported from up to 1510 m altitude (a new observation). Most if not all species in Australia are nocturnal (H. Howden et al. 2007). Papuan species were sampled in light traps, flight interception traps or at dung bait (H. Howden 1990). During our studies, the single specimen of *A. arfakianus* sp. nov. was collected at light set at the edge of primary lower montane rainforest in Arfak Mountains on Doberai Peninsula of New Guinea.

Papuan region used in the text means zoogeographic term in sense of Gressitt (1982), Beehler et al. (1986), and Telnov (2011). This area is defined as the Sahul continental shelf islands with the Pacific Ocean north and east of New Guinea and Torres Strait south of it. In the west, chains of Moluccan Islands (North, Central and South Moluccas) with high percentage of Papuan fauna elements are also considered part of the Papuan region with Weber's Line used as western boundary of the region as a line of fauna balance.

Taxonomic part

Australobolbus arfakianus sp. nov. (Fig. 1, plate 92 figs 1-2)

http://zoobank.org/6E8A223C-767A-46FD-949C-A065AB75C835

Holotypus ♀ Naturkundemuseum Erfurt: INDONESIA E, W New Guinea, Doberai Peninsula, Arfak mts, Syoubri vill., 1°06’40S, 133°54’36”E, 1510 m, edge of secondary lower montane rainforest, 12-13.IX.2015, MV light, leg. D.Telnov.

Derivatio nominis: Toponymic. This species is named after Arfak Mountains, its area of occurrence.

Measurements, holotype ♀: Total body length 10.5 mm. Head 2.7 mm long, maximum width across genae 2.65 mm, pronotum at midline 3.5 mm long, maximum width at basal third 5.2 mm, elytra 3.9 mm long, maximum combined width at basal third 5.3 mm.

Colouration: Head dorsally reddish brown on labrum, clypeus and frons, black posterior to eyes. Antennae orange with dark brown club. Mouth parts dark red. Pronotum black. Scutellum black brown. Elytra very dark brown. Legs dark reddish-brown with paler femora. Underside of head orange, thorax reddish to reddish-brown, abdomen dark brown.

Description, female: Head opaque, shallowly impressed on frons. Labrum 1.4 times wider than long. Anterior margin truncate, provided with long yellowish setae. Labrum acute angulate at transverse midline, angulation less acute near lateral margins. Surface of labrum microscopically reticulate and with several short irregular longitudinal carinae derived from transversal angulation. Clypeus with anterior edge provided with dense comparatively short yellowish setae. Anterior and posterior carinae equally developed, well-defined. Anterior and posterior carinae merging at obtuse median tubercle (horn). Anterior carina on each side of tubercle arcuate. Posterior carina hardly arcuate, ending laterally in obtuse, well-defined tubercle. Lateral tubercles hardly less prominent than median one. With short obsolete longitudinal median carina arising from median horn and disappearing approximately at position line of lateral tubercles. Surface of clypeus coarse irregularly punctate, intervening spaces distinctly microscopically reticulate. Frons and anterior part of vertex concave, less coarse and more sparsely punctate and dense microscopically reticulate. Vertex with moderately elevated sinuate transverse carina across median half or more between eyes. Surface before and behind transverse carina feebly concave. Transverse carina not extending to lateral longitudinal carinae. Gena slightly longer than wide, outer anterior angle angulate, provided with little denticle. Surface of gena coarsely punctate and microscopically reticulate. Eyes large, finely facetted, deeply emarginated. Pronotum dorsally moderately convex, opaque. With indented longitudinal midline in anterior half, obsolete in basal half and only defined by narrow line of punctures reaching base of pronotum. Parallel indentation by irregular coarse punctures present on each side of midline in anterior half of pronotum in line with inner edge of eye. Lateral thirds of pronotum provided with dense very coarse and large punctures. Lateral and sides of basal margin provided with very long dense yellow setae. Scutellum broad, shiny, rounded apically, provided with dense moderate-sized punctures and very fine intermediary microreticulation. Elytra dorsally moderately convex, slightly shiny. Elytral striae deep, each stria with a row of small, longitudinal punctures separated by 1-4 diameters. Interstrial intervals moderately convex. 11th and 12th striae closely approximate anteriorly and merging. Epipleura provided with sparse delicate short yellowish pubescence. Legs: Protibia with 6 teeth on outer margin. Tarsi long. Femora and tibiae provided with extraordinary long yellow setae. Metasternum anteriorly between middle coxae wide, 0.7-0.8 mm. Its midline impressed. In lateral view metasternal surface highest anteriorly and medially before middle of coxae, surface then sloping downward to posterior face.

Dimorphism: The male is currently unknown.

Differential diagnosis: *Australobolbus arfakianus* sp. nov. is different from its congeners by the

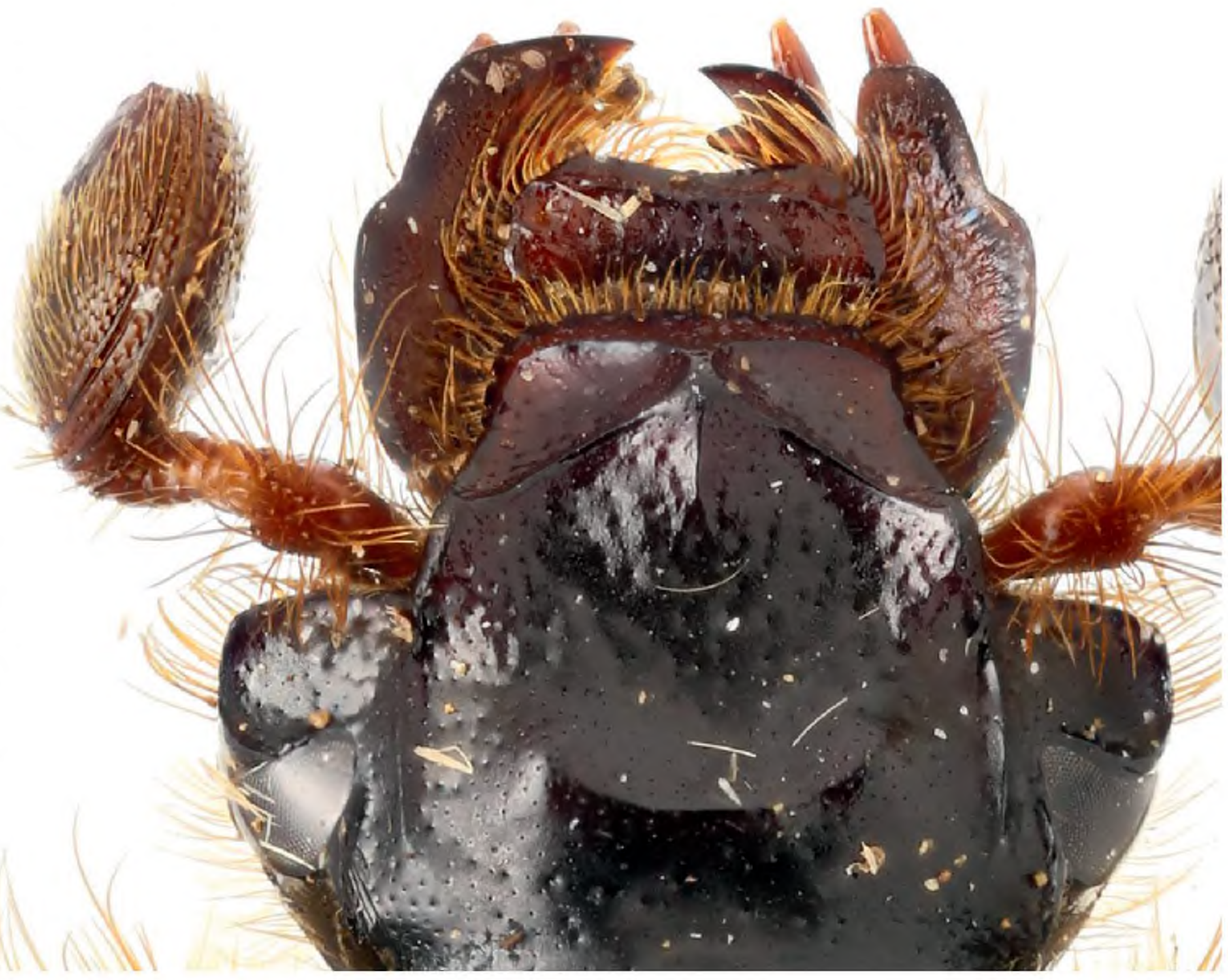

Figure 1. *Australobolbus arfakianus* sp. nov., holotype ♀: head, dorsal view.

combination of the following characters: anterior and posterior carinae of clypeus equally developed, clypeus with median tubercle (horn) at merge place of anterior and posterior carinae, transverse carina of vertex moderately and evenly elevated (without higher lateral tubercles, e.g. not bituberculate), sinuate, extending over a half or more of intraocular distance, gena slightly longer than wide, dorsal body colouration very dark brown to black.
Ecology: The only known specimen was attracted at midnight to mercury vapour light set at clearing near the edge of primary lower montane rainforests at altitude of 1510 m (Plate 93). The specimen came to the light during a moderate rain.
Distribution: Only known from the locus typicus, Arfak Mountains of Doberai Peninsula, western New Guinea.

Annotated species list of Papuan *Australobolbus* H. Howden et J. Cooper, 1977

Notes: Species in the list arranged alphabetically, since no phylogenetic arrangement has been made. Page of description is given for each taxon after the author and year of description.

Geotrupidae Latreille, 1802: 142
Bolboceratinae Mulsant, 1842: 347
Australobolbini Nikolajev, 1996: 96

Australobolbus H. Howden, J. Cooper, 1977: 19
Type species: *Bolboceras obscurius* Blackburn, 1904, original designation.

Australobolbus arfakianus sp. nov.
Distribution: Indonesian New Guinea (Arfak Mountains, Doberai Peninsula of New Guinea).
Note: Known only from the holotype.

Australobolbus bacchusi H. Howden, 1990: 275
Distribution: Papua New Guinea (Central Cordillera, Adelbert Mountains & Huon Peninsula).

Australobolbus cruciatus H. Howden, 1990: 280
Distribution: Australia (Torres Strait Islands), Papua New Guinea (Papuan Peninsula).

Australobolbus latipennis H. Howden, 1990: 277
Distribution: Indonesian New Guinea (northern New Guinea W of Jayapura).

Australobolbus loweri laratinus (Arrow, 1916: 493)
Distribution: Australia (Queensland), Tanimbar Islands (Larat Island), Papua New Guinea (Transfly lowlands, Central Cordillera & Finisterre Mountains).

Australobolbus papuanus H. Howden, 1990: 274
Distribution: Papua New Guinea (Central Cordillera & Huon Peninsula).

Australobolbus parvus H. Howden, 1990: 281
Distribution: Papua New Guinea (Papuan Peninsula).
Note: Known only from the holotype.

Australobolbus rotundatus (Hope, 1841: 43)
Distribution: Australia (Northern Territory, Queensland), southern New Guinea (Transfly lowlands).

Australobolbus tricornis H. Howden, 1990: 278
Distribution: Papua New Guinea (Huon Peninsula).
Note: Known only from the holotype.

Identification key to *Australobolbus* H. Howden et J. Cooper, 1977 species from the Papuan region

This key is adapted from H. Howden (1990), with the addition of the new species and editorial corrections.

1 Vertex between or behind eyes with transverse carina, extending 1/3 or more of width of vertex and often with tubercle at each end. Vertex shallowly concave anterior to and sometimes posterior to carina 2
– Vertex with a pair of small horns or large tubercles near inner margin of eye. These horns not connected by transverse carina. Vertex usually concave between horns .... *A. papuanus*
2 Clypeus with anterior and posterior carinae equally developed or anterior carina stronger than posterior. Species with or without median clypeal tubercle 3
– Clypeus with posterior carina well developed. Anterior carina feeble or obsolete. Median tubercle (horn) absent. Lateral tubercles absent or very poorly developed .... *A. loweri laratinus*
3 Clypeus with distinct median tubercle or horn. Vertex with transverse carina on each side ending abruptly, usually delimited by small tubercle on each side. Labrum without V-shaped median carina (except in *A. tricornis* where V-shaped median carina present on labrum) .. 4
– Clypeus without distinct median tubercle. Vertex with transverse carina extending most of distance between longitudinal carina on each side above eye. Transverse carina feebly sinuate, gradually sloping downward at each end. Labrum with V-shaped median carina .... *A. latipennis*
4 Clypeus with tubercles moderately developed. Median tubercle (horn) connected to lateral tubercle on each side by well-developed carina. Labrum with median carina if present than not V-shaped 5
– Clypeus with tubercles strongly developed. Median tubercle (horn) connected to lateral tubercle on each side by feebly developed carina. Labrum with V-shaped median carina .... *A. tricornis*

5 Vertex with transverse carina extending ¼ or more of intraocular distance 6
– Vertex with transverse carina short, extending less than ¼ of intraocular distance .... *A. rotundatus*
6 Colour usually very dark brown. Vertex with transverse carina moderately to strongly elevated, extending approximately ¼–½ of intraocular distance. Protibia with 6 denticles on outer margin 7
– Colour reddish brown. Vertex with transverse carina feebly elevated, extending approximately ½ or more of intraocular distance. Protibia with 7 denticles on outer margin .... *A. parvus*
7 Vertex with transverse carina distinctly bituberculate – feeble medially and delimited by stronger lateral tubercle on each side 8
– Vertex with transverse carina moderately elevated, not delimited laterally by stronger tubercles. Clypeus with anterior and posterior carinae merging at small median horn. Anterior carina on each side of tubercle arcuate. Posterior carina hardly arcuate. With short low longitudinal median carina arising from median horn and disappearing approximately at position line of lateral tubercles. Labrum with distinct long transverse carina .... *A. arfakianus* sp. nov.
8 Pronotum with midline impressed but lacking parallel line of punctures on each side in line with inner margin of each eye .... *A. cruciatus*
– Pronotum with midline impressed and with longitudinal line or cluster of punctures on each side of the midline, approximately in line with inner margin of each eye .... *A. bacchusi*

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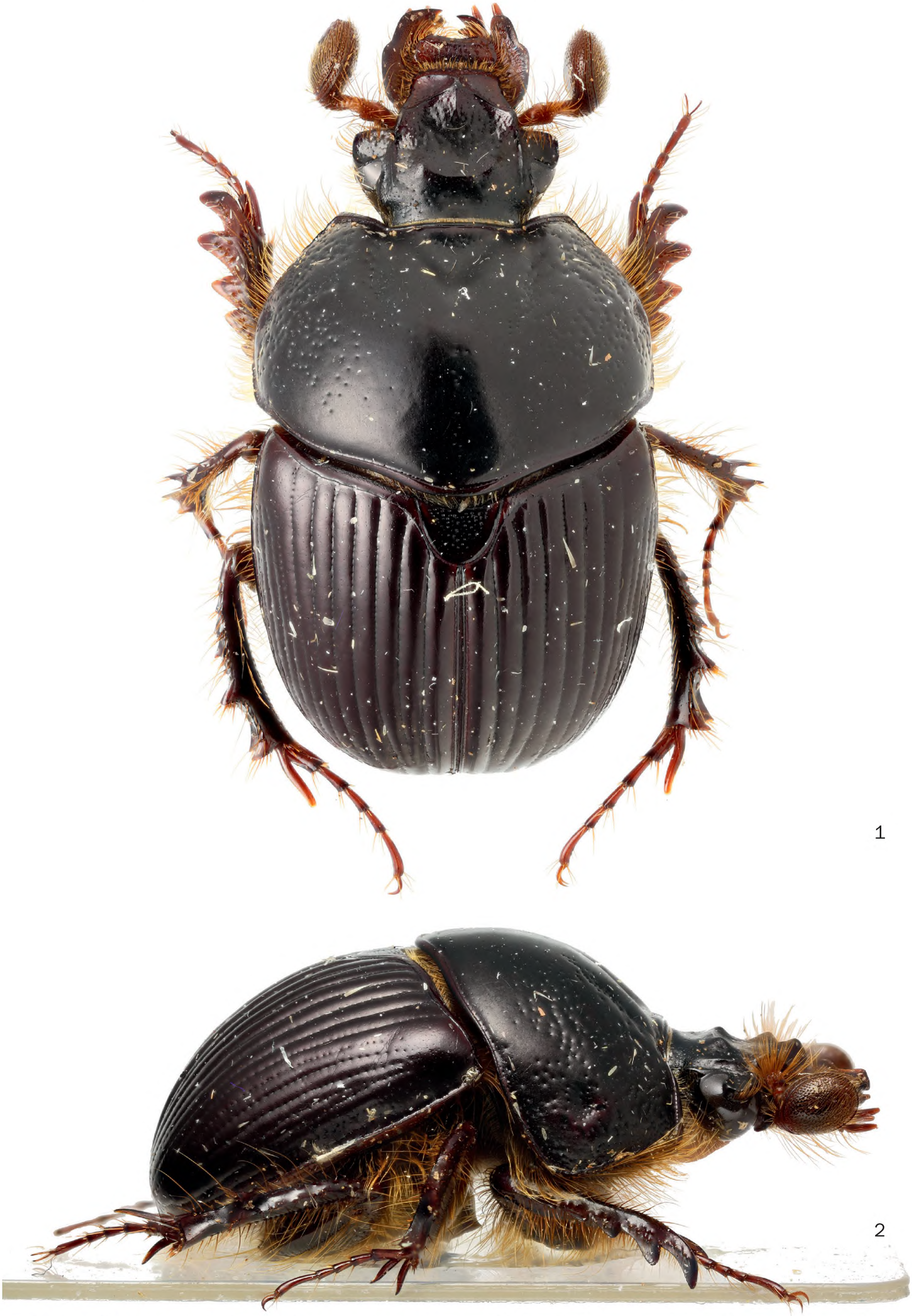

Figures 1-2. *Australobolbus arfakianus* sp. nov., holotype ♀. 1 – Habitus, dorsal view; 2 –ditto, lateral view.

Plate 93

Telnov, D.: New *Australobolbus* H. Howden et J. Cooper, 1977 (Coleoptera: Geotrupidae: Bolboceratinae) ...

1

2

Figures 1-2. *Australobolbus arfakianus* sp. nov. habitat. 1 – Primary mid-montane rainforest in the type locality of this species; 2 – Place of installation of the light trap (consider two vertical sticks at the nearest fallen tree) (photos: D.Telnov, 2015).